CLAIMS

1. A method for producing a membrane electrode assembly for solid polymer electrolyte fuel cell, said membrane electrode assembly comprising a solid polymer electrolyte membrane composed of an ion exchange membrane, a first electrode having a first catalyst layer, and a second electrode having a second catalyst layer, said first electrode and said second electrode being disposed adjacently to said solid polymer electrolyte membrane and opposed to each other via said solid polymer electrolyte membrane, said method comprising the steps of:

a step A of applying a first coating solution containing a catalyst 1 onto a base film to form a first catalyst layer;

a step B of applying a coating solution for forming an ion exchange membrane containing an ion exchange resin dissolved or dispersed in a liquid onto said first catalyst layer to form an ion exchange membrane;

a step C of applying a second coating solution containing a catalyst 2 onto said ion exchange membrane to form a second catalyst layer; and

a step D of peeling off said base film from a laminate comprising said first catalyst layer, said ion exchange membrane and said second catalyst layer formed on said base film via said steps A to C.

2. The method for producing a membrane electrode assembly in accordance with claim 1, wherein each of said step A, said step B and said step C includes a procedure of drying a respective coating solution after the application thereof to remove a liquid component contained in said coating solution, said step A, said step B and said step C are performed continuously in that order.

3. The method for producing a membrane electrode assembly in accordance with claim 1 or 2, wherein: a coating solution containing an electrically-conductive carbon material and a binding material is applied onto said base film to form a first electrically-conductive layer prior to said step A; said first coating solution is applied onto said first electrically-conductive layer at said step A; and after said step C, a coating solution containing an electrically-conductive carbon material and a binding material is applied onto said second catalyst layer to form a second electrically-conductive layer.

4. The method for producing a membrane electrode assembly in accordance with claim 3, wherein said binding material is a fluorine-contained polymer which is soluble in a solvent substantially free of an ion exchange group.

5. The method for producing a membrane electrode assembly in accordance with any one of claims 1 to 4, wherein said ion exchange resin contained in said coating solution for forming an ion exchange membrane comprises a perfluorocarbon

polymer having a sulfonic acid group.

6. The method for producing a membrane electrode assembly in accordance with any one of claims 1 to 5, wherein each of said catalyst 1 and said catalyst 2 is a support catalyst supporting a metal catalyst on carbon, said metal catalyst being composed of platinum or a platinum alloy, and said first coating solution and said second coating solution contain a perfluorocarbon polymer having a sulfonic acid group.

7. The method for producing a membrane electrode assembly in accordance with any one of claims 1 to 6, wherein each of said first catalyst layer and said second catalyst layer is formed to have a thickness of not more than 20 μm, and said ion exchange membrane is formed to have a thickness of from 3 to 40 μm.

8. The method for producing a membrane electrode assembly in accordance with any one of claims 1 to 7, wherein after said step C, the resulting laminate is subjected to a heat treatment.

9. The method for producing a membrane electrode assembly in accordance with claims 8, wherein said heat treatment is performed in an atmosphere intercepted from oxygen.

10. The method for producing a membrane electrode assembly in accordance with any one of claims 1 to 9, wherein said first electrode is used as an anode, and said second electrode is used as a cathode.

11. A method for producing a solid polymer electrolyte fuel cell comprising a membrane electrode assembly, said membrane electrode assembly comprising a solid polymer electrolyte membrane composed of an ion exchange membrane, a first electrode having a first catalyst layer, and a second electrode having a second catalyst layer, said first electrode and said second electrode being disposed adjacently to said solid polymer electrolyte membrane and opposed to each other via said solid polymer electrolyte membrane, said method comprising the steps of:

a step A of applying a first coating solution containing a catalyst 1 onto a base film to form a first catalyst layer;

a step B of applying a coating solution for forming an ion exchange membrane containing an ion exchange resin dissolved or dispersed in a liquid onto said first catalyst layer to form an ion exchange membrane;

a step C of applying a second coating solution containing a catalyst 2 onto said ion exchange membrane to form a second catalyst layer; and

a step D of peeling off said base film from a laminate comprising said first catalyst layer, said ion exchange membrane and said second catalyst layer formed on said base film via said steps A to C.

12. The method for producing a solid polymer electrolyte fuel cell in accordance with claim 11, wherein

each of said catalyst 1 and said catalyst 2 is a support catalyst supporting a metal catalyst on carbon, said metal catalyst being composed of platinum or a platinum alloy, and said coating solution for forming ion exchange membrane, said first coating solution and said second coating solution contain a perfluorocarbon polymer having a sulfonic acid group.

13. The method for producing a solid polymer electrolyte fuel cell in accordance with claim 11 or 12, wherein: a coating solution containing an electrically-conductive carbon material and a binding material is applied onto said base film to form a first electrically-conductive layer prior to said step A; said first coating solution is applied onto said first electrically-conductive layer at said step A; and after said step C, a coating solution containing an electrically-conductive carbon material and a binding material is applied onto said second catalyst layer to form a second electrically-conductive layer.

14. The method for producing a solid polymer electrolyte fuel cell in accordance with any one of claims 11 to 13, wherein after said step C, the resulting laminate is subjected to a heat treatment.

15. The method for producing a solid polymer electrolyte fuel cell in accordance with any one of claims 11 to 14, wherein said first electrode is used as an anode, and said second electrode is used as a cathode.